Montana DNRC Forestry Division

FIRE AND AVIATION MANAGEMENT

Aviation

Equipment Development and Support

Fire Preparedness

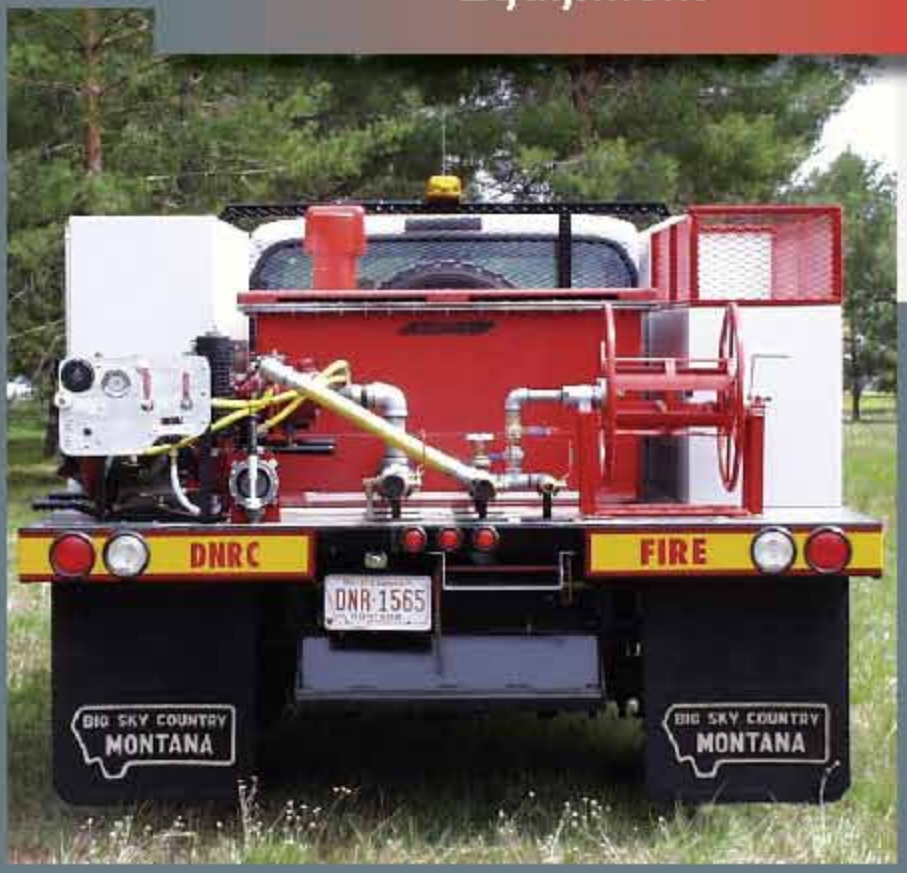
Fire Prevention

Fire Suppression

Training

Equipment Development and Support

Designing and Developing Firefighting Vehicles and Equipment



EQUIPMENT DEVELOPMENT

Montana Department of Natural Resources and Conservation

Forestry Division
Fire and Aviation Management Bureau
Equipment Development and Support

DNRC's Equipment Development and Support Program is responsible for designing and developing firefighting vehicles and equipment to support the Department's Direct Protection Program and the State/County Cooperative Fire Program. Approximately 70% of the program's annual workplan is directed toward redevelopment of used vehicles as wildland firefighting engines for the State/County Coop Program. Under this program, local fire departments provide initial response to wildland fires on 45 million acres of state and privately owned land. In exchange, DNRC provides the fire departments with training, equipment, prevention materials, and large fire support.

The Equipment Development and Support Program develops about 18 firefighting vehicles each year. Program staff are responsible for acquiring used vehicles, assessing repair needs and making necessary repairs, building and installing the firefighting package for the vehicle, testing the vehicle before it is placed in the field, and helping to train each vehicle's new users in its operation and maintenance.

Accomplishments
FY 2004

Type 6 (200 gallon) engines	7
Type 6 (300 gallon) engines	5
Type 6 (400 gallon) engines	2
Type 5 (500 gallon) engines	2
Type 4 (800 gallon) engines	2
Water Tender (1,000 gallon)	1
Construct flatbeds	19
Rebuild pump panels	29
Rebuild pump heads	30

Goal

Provide safe, efficient, and cost-effective firefighting equipment.

Saving Tax Dollars by Transforming Second-hand Vehicles into First-rate Firefighting Equipment

Most of the equipment in the State/County Cooperative Fire Program was acquired through the Federal Excess Property Program (FEPP). Through this program, property originally purchased for use by a federal agency is acquired by the USDA Forest Service to loan to one of the 50 states for use in wildland fire protection. By acquiring vehicles and equipment through the FEPP, DNRC realizes tremendous cost savings compared to the cost of purchasing new or comparable used equipment. DNRC acquires about $2.5 million worth of items each year through the FEPP, and has a total inventory of FEPP items worth $33 million.

The Equipment Development and Support Program also acquires and rebuilds used vehicles from the Bureau of Land Management and USDA Forest Service, and totally rebuilds direct protection engines that have been in service for 10 or more years. By rebuilding used vehicles and equipment, DNRC uses taxpayers' dollars efficiently, saving approximately $25,000 on each wildland fire engine developed compared to the cost of an equivalent vehicle purchased from a private contractor, for a total savings of about $450,000 each year.

How Used Vehicles Become Elite Firefighting Equipment

Step 1: Needs Assessment and Workplan Development

Each year, the Equipment Development Center (EDC) solicits information from fire program managers at DNRC Forestry's six Land Offices regarding needs and requests for firefighting equipment development and redevelopment. The fire program managers coordinate with county fire wardens to help determine needs for the State/County Cooperative Fire Program. The EDC works with the fire program managers to negotiate the amount of equipment that can be produced, and develops its annual workplan.

Left: Typical vehicle acquired from the Federal Excess Property Program, which loans vehicles to the states for use in wildfire fighting programs. Right: The vehicle after development by the EDC for firefighting.

Step 2: Vehicle Acquisition

The EDC acquires used vehicles from several sources, including vehicles loaned through the Federal Excess Property Program, vehicles purchased at fair market value from the Bureau of Land Management, and turn ins from DNRC's Direct Protection Program. Each year the program also redevelops a number of vehicles that have provided service in the State/County Cooperative Fire Program for 10 years or longer.

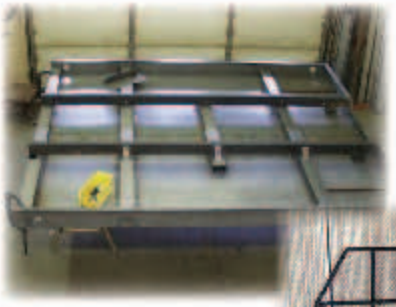
Step 3: Vehicle Development

When a vehicle is brought to the EDC for development or redevelopment, the first task is to determine what parts of the vehicle need to be repaired, rebuilt, or replaced. Because the vehicles rarely come with maintenance records, the only way to determine repair needs is to disassemble the entire vehicle, including removing the body from the chassis and disassembling the entire chassis.

Rebuilding a chassis.

While one mechanic works on the vehicle's chassis, other members of the EDC team work on the bed and body of the vehicle, and on the components of the firefighting package. Working simultaneously on different parts of the vehicle speeds the development process; on average, it takes 30 working days to develop a vehicle.

Nearly all the work to develop or redevelop a vehicle is done at the EDC. A few tasks, such as the bending of metal plates for truck beds, are contracted to the private sector because of the cost of the equipment required for the tasks. The EDC contracted other tasks in the past, such as the building of entire truck beds, but found that the workmanship did not meet the exacting specifications required for its vehicles, which are designed to accommodate the components of a pumping unit in precise positions and to provide service for 10 years or more. In addition to producing a superior product, in-house fabrication of truck beds saves money. The cost of a bed fabricated by the EDC is $1,500, substantial savings over the $2,800 cost of a bed built by a private contractor.



A truck bed during fabrication... (left)

... and the finished product (right)

Work on the body of the vehicles includes repair and replacement of parts as needed, and painting the entire body. Each of the vehicles is equipped with a firefighting package that includes components such as the pump, pump panel, tank, hose reel, and tool boxes. The EDC has carefully researched potential components of the firefighting package over the years and has selected components for their proven performance, durability, ease of use, and cost effectiveness.

Step 4: Vehicle Testing

Before any vehicle leaves the EDC it is put through a rigorous program of testing to simulate what it will experience under field conditions. Most equipment is tested multiple times to ensure that it will perform flawlessly in the field.

Work in the body shop.

Working on a pump.

The finished product.

The EDC Team

EDC staff members have an average of 25 years work experience, and bring their shared knowledge and skills to bear on the challenge of designing and developing state-of-the-art firefighting vehicles for Montana. Members of the EDC staff work as a team, dedicated to the common goal of building the best firefighting equipment possible. Some EDC staff members participate on wildfire firefighting teams, giving them the opportunity to test the EDC's vehicles under actual field conditions, and to solicit suggestions for improvements from other firefighters.

"When we send these trucks to the field, they're the best they can be because we know someone's life is going to depend on them..."

Step 5: Placement in the Field

When a newly developed or redeveloped vehicle is placed with a fire department, the EDC does more than just turn over the keys. Each vehicle comes with a handbook that contains information about the vehicle and its operation, including a list of work done and warranty information for new parts used in the vehicle, which can help

volunteer fire departments with limited budgets if a part ever needs to be replaced. EDC staff members also

conduct training sessions to help acquaint each vehicle's new users with its proper operation and maintenance.

DNRC Equipment Development Center Firefighting Vehicles

Safe: Safety is a central consideration in the design and development of all EDC vehicles.

Dependable: The EDC rigorously tests all its vehicles before they are placed in the field, and designs its equipment specifically for dependability and durability.

Easy to Use: EDC designs its vehicles and equipment for ease of use and maintenance, and for ease of repair in the field. Users of EDC equipment are often volunteer firefighters, who have limited time available for training. The EDC has developed a standardized design that all firefighters, whether members of volunteer fire departments or DNRC staff, can quickly learn to use.

Cost Effective: The EDC can develop a Type 6 wildland firefighting engine for about 60% of the cost of purchasing a comparable unit from a private contractor.

State of the Art: The EDC is always looking for improvements in design and performance, and has produced a number of design innovations that manufacturers of firefighting equipment now incorporate into their products.

Examples of EDC's Cost Savings in Equipment Development

Item	Cost When Rebuilt by the EDC*	Contract Cost
Type 6** engine truck bed	$1,500	$2,800
Firefighting package	$13,800	$27,000
Complete Type 6 engine	$37,542	$64,000

**Includes EDC labor costs. Approximately $2,800 in labor costs is required to develop a new engine.*
***Type 6 engines are the most commonly developed wildland firefighting engines.*

The "Hybrid" Program

The EDC recently implemented a new program to help fire departments in the State/County Cooperative Fire Program obtain new firefighting vehicles. Through this program, the fire department purchases a new chassis at the state fleet rate, and the EDC builds and installs the firefighting platform on the chassis at no cost to the fire department.

The new program provides several advantages. Fewer military surplus vehicles have been available through the Federal Excess Property Program since the terrorist attacks of September 11, 2001. And over time, it will become increasingly difficult to find replacement parts for the older vehicles that the EDC develops. Several of the new vehicles are already in use.

Vehicles Developed by the Equipment Development Center Help Support the State/County Cooperative Fire Program

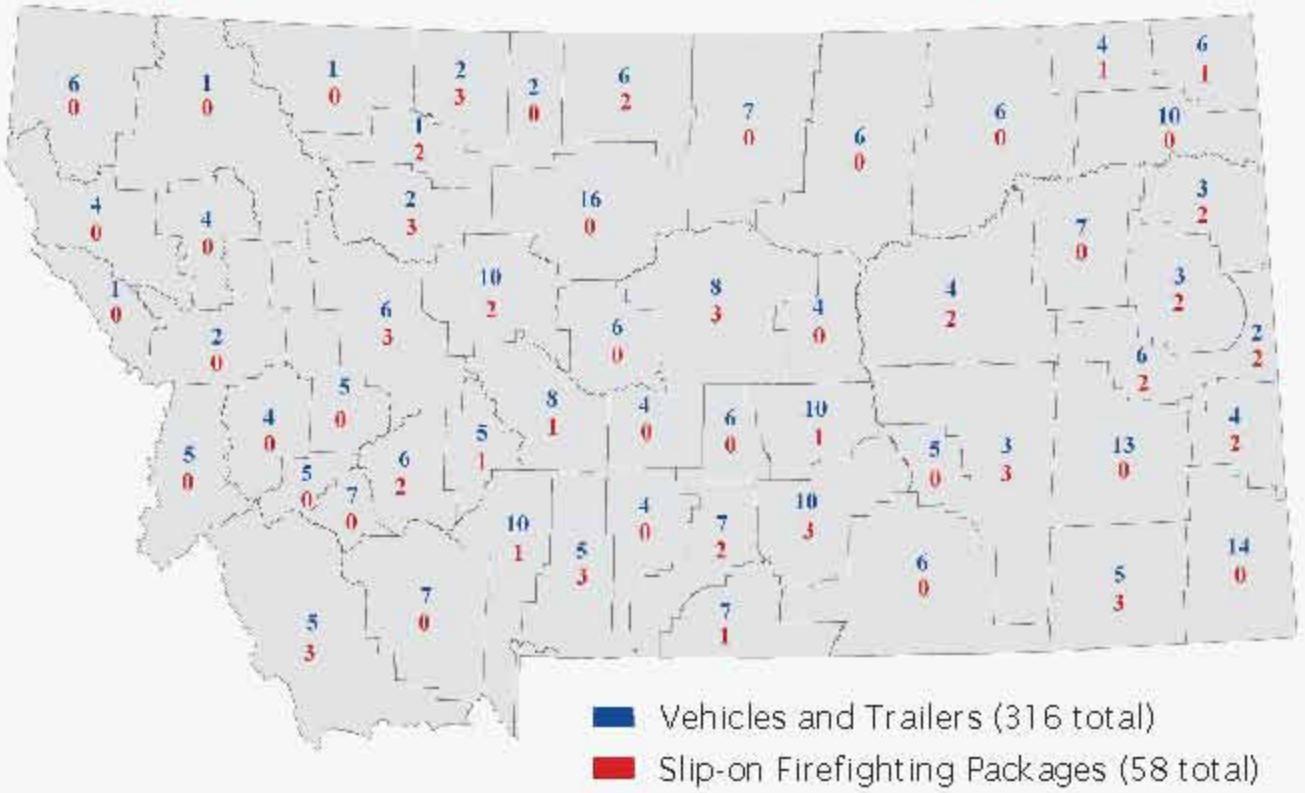
Every county in Montana participates in the State/ County Cooperative Fire Program. Much of the equipment developed by the EDC is placed in the counties to help support this program.

For some rural fire departments, the vehicles loaned by the EDC are the only vehicles the department has. Without the vehicles provided by the EDC, many rural fire departments in Montana would have no equipment or would be operating with substandard equipment. The EDC is helpful even to fire departments that purchase their own equipment, serving as a clearinghouse for information about vehicles and equipment.

A wildland fire engine developed by the EDC in use in Choteau County.

" The standardized equipment the EDC has developed is critical, and enables a firefighter from one department to jump right in on another department's truck and start using it..." Doug Williams, Sheriff and Fire Warden, Choteau County

State/County Cooperative Fire Program Equipment Placement as of January 2005



Top cover photo of the Robert Fire by Karen Nichols, *Daily Inter Lake*, Kalispell, MT.

Persons with disabilities who need an alternative, accessible format of this document should contact DNRCat Department of Natural Resources and Conservation, Forestry Division, 2705 Spurgin Road, Missoula, MT 59804-3199. Phone (406) 542-4300 or fax (406) 542-4217. 500 copies of this document were published at an estimated cost of $2.70 per copy. The total cost of $1,350 includes $1,350 for printing and $0 for distribution.